

THE BLIZZARD IN THE ZARAND LAND

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Résumé: *La tempête de neige dans la Terre de Zarand* - c'est un travail qui synthétise les résultats de la statistique au sujet de la tempête de neige basés sur les données de six stations météorologiques, en tenant compte de la variabilité dans le temps et l'espace des paramètres et de la vulnérabilité de la région Zarand se referant à ce phénomène.

Mots-clés: tempête de neige, variabilité, vulnérabilité

In Romania, the blizzards were studied by Hepites(1898), Balescu and Besleaga (1962), Draghici (1968, 1980, 1983, 1986), Bogdan -Seitan (1969, 1973, 1978, 1980, 1992), Ciovica and colab. (1973), Bordei –Ion Ecaterina and Bordei – Ion Nicolae (1983), Militaru and Draghici (1985), Ciulache and Ionac (1995) and others.

The blizzard is a complex meteorological phenomena at which's formation participate two elements: the speed of wind and the quantity of snowfall. Not any blizzard can be considered a climatic risk phenomena (Octavia Bogdan, 1999) only those characterized by wind's high speed.

The genetic causes of blizzards are represented by the result of the interaction between the particularities of the general atmospheric circulation and the characteristics of the active surface.

In the purpose of showing the characteristics of blizzards in Zarand Land, meteorological data was analyzed, from the period from 1970 to 2006, from six stations in the study area: Chisineu Cris, Ineu, Gurahont, Tebea, Siria and Moneasa – Izoii.

In the analysis of blizzards we take into consideration:

- the average and extreme occurrence data;
- the risk interval;
- the average number of monthly and annual blizzards days;
- the tendency of evolution;
- the maximum monthly and annual blizzards days;
- the wind's speed and direction;
- the quantity of snow deposited during a blizzard;
- the maximum thickness of the snow layer.

The average and extreme occurrence data.

The first blizzard occurrence took place at Chisineu Cris and Siria at the end of December and the beginning of January. The first blizzard appeared two weeks earlier. The earlier first blizzard was registered at Moneasa –Izoi on November 10, 1981.

The average data for the last blizzard is situated in the last decade of February. The latest blizzards appeared in March at Chisineu Cris and even in April at Moneasa-Izoi, where a blizzard was registered on April 14, 1988.

The risk interval is set between the third December decade and the third February decade, at Chisineu Cris, lasting for about two months. For Siria the duration of risk interval is shorter, blizzards occur mainly in February, while at Moneasa, the interval is set

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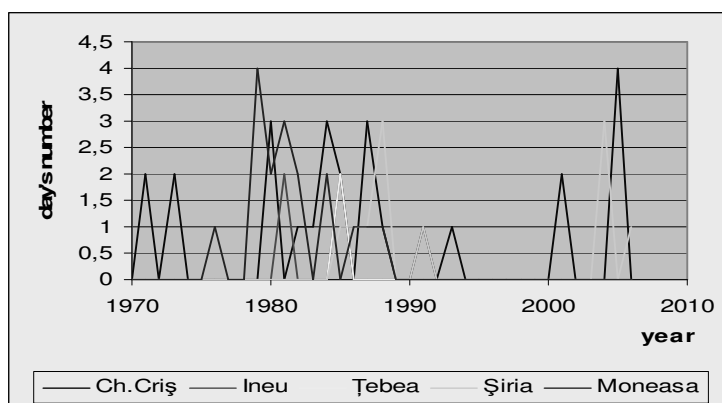
between the first decade of January and the second decade of February. Moneasa – Izoi has the longest period of risk interval, which is considered to be between November 11 and April 14.

The average number of monthly and annual blizzard days is less in the interior of lowland passage of Crisul Alb river and higher in the adjacent regions (table 1).

Average number of monthly and annual blizzard days **Table 1**

Month Station	XI	XII	I	II	III	IV	Annual
Chişineu Criş	-	0,1	0,2	0,4	0,1	-	0,8
Ineu	-	0,1	-	0,1	-	-	0,2
Gurahonţ	-	-	-	-	-	-	-
Tebea	-	-	-	0,03	-	-	0,03
Şiria	-	0,1	0,1	0,3	-	-	0,5
Moneasa Izoi	0,1	0,1	0,6	0,2	-	0,1	1,1

From year to year, the annual number of blizzard days presents variations as it can be seen in figure 1.



The highest number of days when the blizzard sets in is at Chisineu Cris – 5 days, and the lowest is at Tebea -1 day in 1985.

Maximum monthly and annual number of blizzard days **Table 2**

Month Station	XI	XII	I	II	III	IV	Annual
Chişineu Criş year	-	2 1973	3 1980	3 1985	2 1971	-	5 1985
Ineu year	-	2 1981	-	2 1985	-	-	2 1981,85
Gurahonţ year	-	-	-	-	-	-	-
Tebea year	-	-	-	1 1985	-	-	1 1985
Şiria year	-	1 1986	1 1987	3 2004	-	-	3 2004
Moneasa – Izoi year	2 1981	1 1982	4 1979	2 1979	-	1 1988	4 1979

The tendency of blizzard days number evolution is descendent, as it can be seen in figure 2.

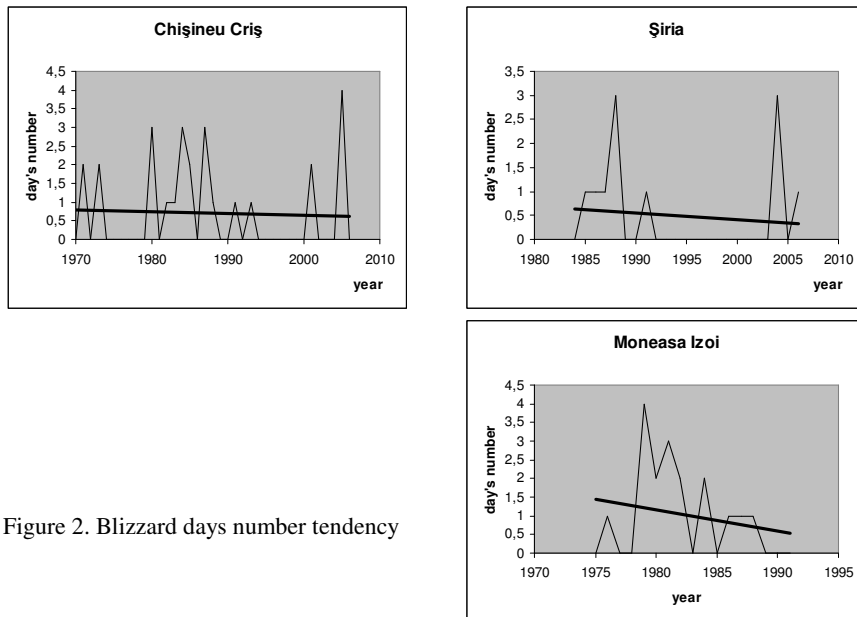


Figure 2. Blizzard days number tendency

During the year the number of blizzard days presents variations. The highest number appears in February and the lowest in November and April (figure 3).

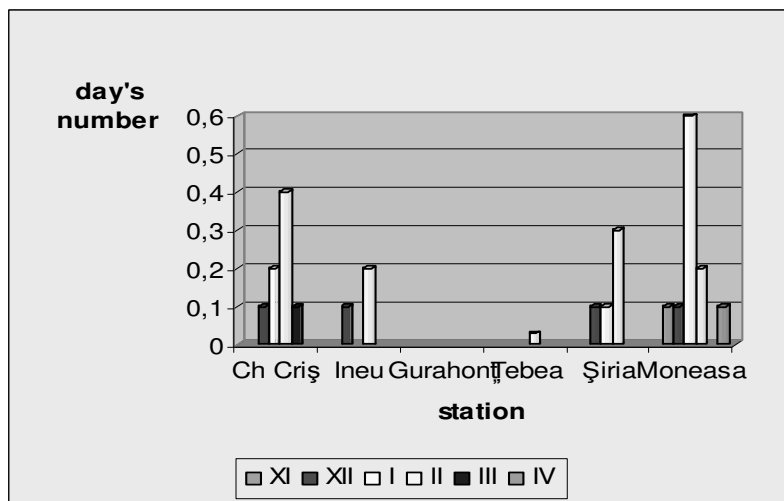


Figure 3 Monthly average number of blizzard days (1970-2006)

Maximum monthly blizzard days number appears on February when the number is between 1 day in Tebea and 3 days in Chisineu Criş (1984, 1985). It reached the maximum number of days on January, while in Moneasa, the blizzard set in for 4 days (figure 4).

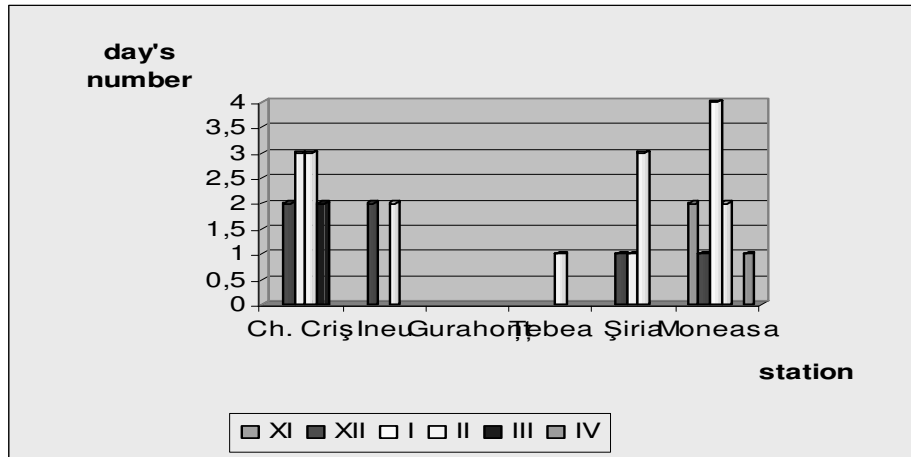


Figure 4 Maximum monthly blizzard day number

In the case of blizzards, the wind speed is the most important risk factor. The high wind speed combines with low temperatures producing bioclimatic stress. The highest wind speed was 40 m/s at Șiria (table 3).

Speed and wind direction during a blizzard

Table 3

Month	Station	XI	XII	I	II	III	IV	Annual
	Chișineu Criș	-	S /14	N /20	N / 24	N / 14	-	N / 24 feb.1984
	Ineu	-	S /12	-	NNE/20	-	-	NNE/20 feb.1985
	Gurahonț	-	-	-	-	-	-	-
	Țebea	-	-	-	VNV/28	-	-	VNV/28 feb.1985
	Șiria	-	S /10	S /10	S /40	-	-	S /40 feb. 1988
	Moneasa – Izoi	NNV/11	N /8	NE /12	NNE/10	-	N /8	NE/12 ian.1976

The persistency amplifies the risk character of blizzards. Usually, blizzards last for a few hours, but there are cases in which blizzards last longer, for example on February 10, 1984, at Chișineu Criș, the duration of a blizzard 3 days.

The maximum quantity of snowfall during blizzards wasn't high as it can be seen in table 5.

Maximum quantity of snowfall during a blizzard

Table 5

Month station	XI	XII	I	II	III	IV	Annual
Chișineu Criș	-	1,7	15,7	4,7	1,0	-	15,7/ian.1980
Ineu	-	15,3	-	2,4	-	-	15,3/ian.1981
Gurahonț	-	-	-	-	-	-	-
Țebea	-	-	-	3,6	-	-	3,6/feb.1985
Șiria	-	13,0	3,8	8,4	-	-	13,0/dec.1986
Moneasa Izoi	5,3	7,7	14,2	7,1	-	18,6	18,6/apr.1988

The thickness of the snow layer formed during a blizzard was low - between 5 cm in Chișineu Criș, 6 cm in Șiria and higher in Moneasa: 30-60 cm.

The vulnerability to blizzards in Zarand Land is low as it can be seen in figure 5.

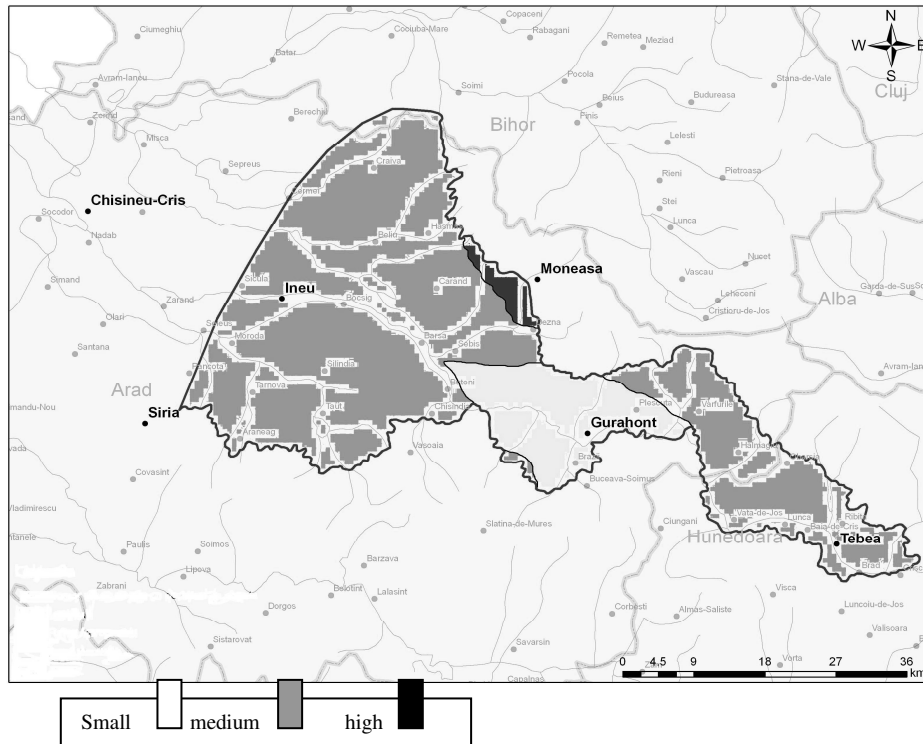


Figure 5. Vulnerability to blizzards

Conclusions

- in Zarand Land blizzards are a rare phenomena
- the duration, the snow quantity, and the thickness of the snow layer have low values, these parameters do not represent the characteristics of a climatic risk phenomena
- however, blizzards may represent a climatic risk phenomena because of the high wind speed combined with low temperatures

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